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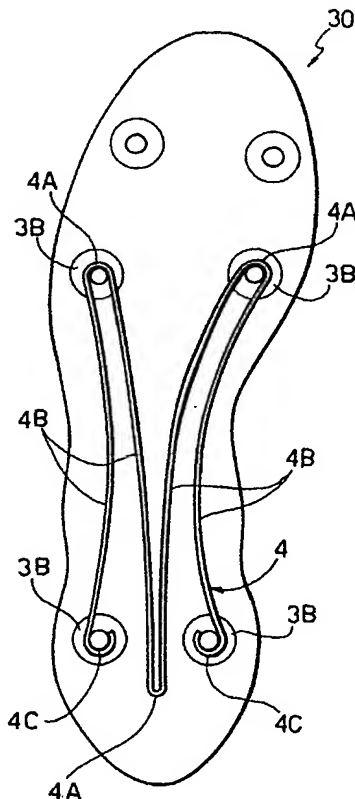
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(54) Title: FOOT-WEARS, NAMELY SPORT FOOT-WEARS, AND PRODUCTION METHOD THEREOF



(57) Abstract: The foot-wears according to the invention, in particular sport foot-wears, comprise a sole (3) of molded synthetic material, within which internal 5 stiffening means (4) are provided. The stiffening means comprise at least an insert (4) of thread-like form, or anyway of thin and elongated form, defining a plurality of intermediate bends (4A); the intermediate bends (4A) define, along the development of the insert (4), two or 10 more stretches (4B, 4D) which extend side by side in at least a zone of the sole (3); the stretches (4B, 4D) arranged side by side extend in a substantially longitudinal direction or in a transverse direction with respect to the sole (3), depending upon the type 15 of stiffening which is desired for the aforesaid zone.

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**"FOOT-WEARS, NAMELY SPORT FOOT-WEARS, AND PRODUCTION  
METHOD THEREOF"**

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**TEXT OF THE DESCRIPTION**

5 The present invention refers to the field of foot-  
wears, in particular sport foot-wears, and to a method  
for the production of foot-wears.

In order to comply with and improve the performances of  
some kinds of foot-wears (and namely those being used  
10 for sports like soccer, running, tennis) the use is  
known of soles made of synthetic material, which are  
stiffened in one or more respective areas.

At the present state of the art, the cited stiffening  
is obtained by providing more or less rigid inserts  
15 within the body of the sole, such inserts being made of  
synthetic material of the same type of the one used for  
molding the sole.

Said known solution, besides determining a certain  
increase of the overall weight of the sole, and  
20 therefore of the footwear, involves additional  
manufacturing costs, which are determined by the  
necessity of preventively mold the components of  
synthetic material destined to constitute the above  
cited inserts.

25 The mentioned prior art does present, above all, the  
drawback of causing breakings between the base body of  
the sole and the stiffening insert or inserts being  
envisaged.

The present invention has the aim of solving the  
30 aforesaid disadvantages.

Within this frame, an aim of the invention is that of  
obtaining foot-wears whose soles, even if lightweight  
and having the optimal degree of rigidity in the  
desired zones, result of more solid construction than  
35 those which can be obtained according to the present

state of the art; a further aim of the invention is that of indicating a method that allows for manufacturing in a simple and cheap way such foot-wears.

5 These and still other aims, that will turn out mainly clear in the following, are attained according to the present invention by the foot-wears and the method for manufacturing foot-wears having the features of the annexed claims, which are to be meant as an integral  
10 part of the present description.

Further purposes, characteristics and advantages of the present invention will emerge clearly from the ensuing detailed description and from the annexed drawings, which are provided purely by way of explanatory and  
15 non-limiting example and in which:

- figure 1 represents a perspective view of a sport footwear obtained according to the present invention;
- figure 2 represents a plan view of a member of the sole of the footwear of figure 1;
- 20 - figure 3 represents a schematic longitudinal section of the sole of the footwear of figure 1;
- figure 4 represents a schematic longitudinal section of the sole of a footwear obtained according to a first possible variant embodiment of the invention;
- 25 - figure 5 represents a plan view of a member of the sole of a footwear obtained according to a second possible variant embodiment of the invention;
- figure 6 represents a schematic longitudinal section of a sole incorporating the member of figure 5;
- 30 - figure 7 represents a plan view of a member of the sole of a footwear obtained according to a third possible variant embodiment of the invention;
- figure 8 represents a schematic longitudinal section of a sole incorporating the member of figure 7;
- 35 - figure 9 represents a plan view of two members of the

sole of a footwear obtained according to a fourth possible variant embodiment of the invention;

- figure 10 represents a schematic longitudinal section of a sole incorporating the members of figure 9;

5 - figure 11 represents a plan view of two members of the sole of a footwear obtained according to a fifth possible variant embodiment of the invention;

- figure 12 represents a schematic longitudinal section of a sole incorporating the two members of figure 11.

10 In figure 1, reference 1 indicates a footwear as a whole, of the type envisaged for playing soccer or football, the footwear 1 being manufactured according to the invention; footwear 1 comprises an upper 2 and a sole 3, which are mutually joined in a known manner,  
15 for example by sticking.

The way for manufacturing the upper 2 does not pertain to the purposes of the present invention, and consequently it will not be described and illustrated in detail. Sole 3 is made of synthetic material, such  
20 as polyurethane, and has a plurality of fixed studs 3A. According to the present invention, molding of sole 3 is performed such that, in the synthetic material constituting the sole, at least a metallic insert is drowned, being suitably shaped in order to confer a  
25 desired degree of rigidity to at least a zone of the sole 3, and eventually for guaranteeing, at the same time, a given degree of flexibility to at least another zone of the same sole.

In figure 2 a first possible embodiment of the cited  
30 insert is represented, which is indicated with 4 as a whole; the insert 4 has a filiform or thread-like form, or anyway a thin and elongated form; to this purpose, insert 4 can be obtained starting from a usual wire, preferably made of steel.

35 As it can be noticed, along the development of the

thread-like insert 4, a plurality of intermediate bends are defined, indicated with 4A, so as to form a plurality of substantially rectilinear stretches, indicated with 4B. In the case illustrated in figure 2, 5 the insert 4 is provided with three intermediate bends 4A, so as to form four stretches 4B; in the exemplified case, moreover, also the longitudinal ends of the insert 4 has terminal bends 4C.

In figure 3 a schematic section of sole 3 of footwear 10 of figure 1 is illustrated, in which there are also highlighted the positions of a number of fixed studs 3A.

As it can be noticed in such a figure, stretches 4B of the thread-like insert 4 extend mostly in the medial 15 zone of sole 3, in the length direction of the latter and in side by side relationship; such an arrangement of the stretches 4B allows for providing the medial zone of sole 3, which has no studs, with an optimal rigidity in the lengthwise direction.

From figure 3 it is also possible to notice how nearly 20 all the intermediate bends 4A and 4C of the insert 4 are positioned in correspondence of respective studs 3A of the sole 3, for the reasons that will be made clear in the following.

In figure 4 a schematic section is represented of a 25 sole 30 obtained according to a possible variant embodiment of the present invention, and namely a sole of the type being provided with metallic joints or connections 3B, each having a respective central 30 threaded hole, within which there can be screwed a replaceable studs, of known construction, not represented here.

Within sole 30 of figure 4 there is integrated the same thread-like insert 4 as shown in figure 2; also in the 35 case of the embodiment of figure 4 it is possible to

notice how the main part of the intermediate and terminal bends 4A and 4C of insert 4 are positioned in correspondence of respective connections 3B of the sole 30; moreover, also in this case, the stretches 4A  
5 extend longitudinally and side by side in the medial zone of sole 30.

In figure 5 an alternative embodiment is represented, of a thread-like insert envisaged according to the invention, whereas figure 6 represents a sole 3  
10 comprising such an insert. It should be appreciated that in such figures the same reference numbers of the previous figures are used, for indicating elements being technically equivalents to those previously mentioned.

15 In the thread-like insert 4 of figure 5 three zones or portions can be seen, indicated with P, M and A respectively. In portion P, besides an end bends 4C, the insert 4 has two intermediate bends 4A, to define three stretches 4D that extend substantially  
20 transversally to the longitudinal development of sole 3.

Portion P is followed, after an intermediate bend 4A' having a wide radius, by portion M, within which four intermediate bends 4A are provided, so as to define  
25 five stretches 4B that extend substantially longitudinally and side by side in the medial zone of sole 3.

Portion M is followed, after a new intermediate bend 4A' having a wide radius, by portion A; the latter has,  
30 besides an end bend 4C, six intermediate bends 4A, that define seven transversal stretches 4D.

As it can be perceived also from figure 6, portions P, M and A are provided for constituting stiffening means of the rear zone, the medial zone and the front zone of  
35 sole 3, respectively.

As to portion P and, above all, portion A of the thread-like insert 4 of figure 5, it has to be noticed how the arrangement of the stretches 4D allows for preventing transverse torsions of the respective zones  
5 of sole 3, however allowing the necessary flexibility of the same zones in the longitudinal direction.

In the specific case of foot-wears equipped with studs, each stretch 4D extends just between two points of the sole in correspondence of respective studs which are  
10 placed side by side in the transverse direction, so as to obtain stiffening bridges between said studs.

Also in the case being represented in figure 6, the main part of bends which are provided in the thread-like insert 4 are positioned in correspondence of  
15 respective studs 3A of sole 3.

Figures 7 and 8 represent respectively a thread-like insert 4, being substantially similar to that one represented in figure 5, and a sole 30 equipped with such an insert; also in said figures the same reference  
20 numbers of the previous figures are used, for indicating elements being technically equivalents to those already described.

As it can be seen, the thread-like insert 4 of figures 7 and 8 has a smaller number of intermediate bends 4A,  
25 with respect to the case of figures 5 and 6, to define a more reduced number of transverse stretches 4D for the rear and front zones of sole 30.

In the embodiment of the invention of figures 9 and 10, a sole 3 is equipped with, besides an insert 4 for stiffening the medial zone, of a further and distinct  
30 insert 5 for stiffening the front zone of the sole.

Also in the case of the insert 4 of figure 9 there are provided, in addition to two end bends 4C, a series of intermediate bends 4A, some of which having a wide  
35 radius, which are envisaged for obtaining both a



plurality of substantially longitudinal stretches 4B and two transverse end stretches 4D, which realize respective stiffening bridges between pairs of studs 3. On the other hand, insert 5 has, in addition to two end bends 4C, some intermediate bends 4C that define a series of stretches 4D extending transversally in the sole 3.

As it can be imagined, also in the case of the embodiment of figures 9 and 10, the thread-like insert 5 allows for stiffening the front zone of sole 3 in the transverse direction, by means of the stretches 4D, however providing the same zone with the necessary flexibility in the longitudinal direction.

Also in the embodiment of figures 11 and 12 there are provided:

- an insert 4, envisaged either for longitudinally stiffening the medial zone of sole 30, and for obtaining two transverse stiffening bridges for stud pairs adjacent to such a medial zone,
- a further and distinct transverse stiffening insert 5 for the front zone of sole 30, having the already mentioned purposes.

In the case represented in figures 11 and 12, the development of the cited inserts 4 and 5 is closed, i.e., the inserts do not have respective ends. In such an embodiment, insert 4 has four intermediate bends 4A, to define two longitudinal stretches 4B and two transverse stretches 4D, while insert 5 has only two bends 4A, to define two transverse stretches 4D.

The manufacturing process of the soles pertaining to the foot-wears according to the invention is very simple, and is obtained by over-molding the body in synthetic material of the soles on the insert or inserts being envisaged.

To this purpose, a wire is worked with means in

themselves known, in order to shape the insert 4, i.e., so as to present at least the intermediate bends 4A, between which the stretches 4B are defined side by side; the thus obtained insert 4 is then arranged  
5 within a mold envisaged for obtaining the sole 3 or 30, so that the cited stretches 4B arranged side by side are substantially positioned in the medial zone of the sole to be obtained, in the longitudinal direction of the latter.

10 Insert 5, if envisaged, is obtained with a technique similar to the one used for obtaining insert 4; said insert 5 is inserted within the cited mold in correspondence of the front zone of the sole to be obtained, and so as that its stretches 4D are arranged  
15 transversally with respect to the longitudinal development of the sole to be obtained.

If said sole is of the type equipped with studs, the insert 4, and the likely insert 5, is positioned within the mold in such a way that at least some of the  
20 respective bends 4A are arranged in correspondence of inner pins of the mold, envisaged for shaping the studs 3, or in correspondence of the threaded connections 3B, which can be already inserted at least partially in the mold; the presence of the mentioned pins or connections  
25 3B allows for positioning with precision the insert 4 and/or 5 within the respective mold.

The synthetic or thermoplastic material is then injected within the mold, in order to form the sole, said operation being performed in a known manner.

30 It should be noticed that the inserts 4, 5 envisaged according to the invention can be obtained by means of the simple deformation of a thread-like element, and therefore in a faster and cheaper way than the molding of member in thermoplastic material as in the prior  
35 art; the production starting from a thread-like element

also allows for obtaining, in a simple and quick way, inserts 4, 5 of any shape.

In the examples previously described the inserts 4 and 5 are integrated in a lower sole, i.e., the part of the footwear destined to rest directly on the ground; the invention is however directly applicable also for obtaining intermediate soles or insoles.

From the given description the characteristics of the foot-wears according to the present invention and the respective manufacturing method are clear, which characteristics are further detailed in the annexed claims.

From the given description also the advantages of the invention are clear. In particular it has to be emphasized that the soles of the described foot-wears turn out

- of simple and cheap manufacturing,
- of reduced weight, even if they are structurally more solid than those obtainable according to the prior art,
- endowed of the desired degree of rigidity in the medial zone.

Naturally, the principle of the invention being understood, the constructional details and forms of embodiment could be extensively changed with respect to that described and illustrated, by way of example, without leaving the scope of this invention as defined by the enclosed claims.

Within this frame, it should be considered that the attached drawings are aimed at illustrating only some of the several possible embodiments of the invention; the thickness, the material and the configuration of the envisaged thread-like inserts might therefore differ in function of the requirements, based on the specific foot-wears studied for any sport discipline or for different uses (i.e., not for sport).

CLAIMS

1. Foot-wears, in particular sport foot-wears, comprising a sole (3; 30) of molded synthetic material, said sole (3; 30) having internal stiffening means (4, 5), characterized in that said stiffening means (4, 5) comprises at least a first insert (4) of thread-like form, or anyway of thin and elongated form, having a plurality of intermediate bends (4A), said intermediate bends (4A) defining two or more stretches arranged side by side (4B, 4D), along the development of said first insert (4), said stretches (4B) extending in at least a zone of said sole (3; 30) in a substantially longitudinal direction or in a substantially transverse direction with respect to the sole, depending upon the type of stiffening being desired for said zone.
2. Foot-wears, according to claim 1, characterized in that said first insert (4) comprises at least a first portion (M) in which said stretches arranged side by side (4B) extend mostly in the medial zone of said sole (3; 30), in a longitudinal direction with respect to said sole.
3. Foot-wears, according to claim 2, characterized in that said first insert (4) comprises at least a second portion (A, P) extending in at least one between the front zone and the rear zone of said sole (3; 30), the stretches arranged side by side (4D) of said second portion (A, P) extending substantially in a transverse direction with respect to said sole (3; 30).
4. Foot-wears, according to claim 1, characterized in that said stiffening means (4, 5) comprises at least a second insert (5) of thread-like form, or anyway of thin and elongated form, which is separated from said first insert (4) and positioned in a different zone of said sole (3; 30).
5. Foot-wears, according to claim 1, characterized in

that said second insert (5) has a plurality of intermediate bends (4A) between which there are defined, along the development of said second insert (5), two or more respective stretches arranged side by side (4D).

6. Foot-wears, according to claim 5, characterized in that the stretches arranged side by side (4D) of said second insert (5) extends substantially in a transverse direction with respect to the longitudinal development of said sole (3; 30).

7. Foot-wears, according to at least one of the preceding claims, characterized in that said first insert (4) and/or said second insert (5) has or have a closed development, i.e., without any end.

8. Foot-wears, according to at least one of claims 1 to 6, characterized in that said first insert (4) and/or said second insert (5) has or have bends (4C) in correspondence of the respective ends.

9. Foot-wears, according to at least one of the preceding claims, characterized in that at least some of said bends (4A, 4C) are located in correspondence of studs (3A; 3B) integrated or associated to said sole (3; 30).

10. Foot-wears, according to at least one of the preceding claims, characterized in that said first insert (4) and/or said second insert (5) is or are made of metallic wire, preferably steel.

11. Foot-wears, according to at least one of the preceding claims, characterized in that said sole (3; 30) is a lower sole.

12. Foot-wears, according to at least one of the preceding claims, characterized in that said sole (3; 30) is an intermediate sole.

13. Method for producing foot-wears, in particular sport foot-wears, of the type in which a sole (3; 30)

is associated to an upper (1), the sole being made of molded synthetic material and integrating internal stiffening means (4, 5), characterized in that, in order to obtain said sole (3; 30) there are provided the steps of:

- forming at least a first element (4) of thread-like form, or anyway of thin and elongated form, the first element (4) having a plurality of intermediate bends (4A) between which there are defined, along the development of said first element (4), two or more stretches arranged side by side (4B, 4D);
- inserting the so-obtained first element (4) within a mold envisaged for obtaining the sole (3; 30), in a way that said stretches arranged side by side (4B, 4D) are positioned in a desired zone to be stiffened of the sole (3; 30) to be obtained, said stretches arranged side by side (4B, 4D) being positioned in a substantially longitudinal direction or in a substantially transverse direction with respect to the sole, (3;30), depending upon the type of stiffening being desired for said zone;
- hot injecting said synthetic material within said mold.

14. Method, according to claim 13, characterized in that said first thread-like element (4) is formed so as to have a number of portions (A, M, P), wherein each portion is provided for being positioned in a respective part of said mold, in order to stiffen a corresponding zone of the sole (3; 30) to be obtained.

15. Method, according to claim 13, characterized in that the formation is provided of at least a second element (5) of thread-like form, or anyway of thin and elongated form, having a plurality of intermediate bends (4A), wherein between said intermediate bends (4A) there are defined, along the development of said

second element (5), two or more stretches arranged side by side.

16. Method, according to claim 15, characterized in that said second element (5) is inserted within said  
5 mold so as that the respective stretches arranged side by side (4D) extend in a substantially transverse direction with respect to the direction of extension of the stretches arranged side by side (4B) of said first element (4).

10 17. Method, according to claim 13, characterized in that said first element (4) is positioned within said mold in such a way that at least some of said bends (4A) are in correspondence of studs (3A, 3B) of the sole (3;30) to be obtained.

15

The foregoing substantially as described and illustrated and for the purposes herein specified.

FIG. 1

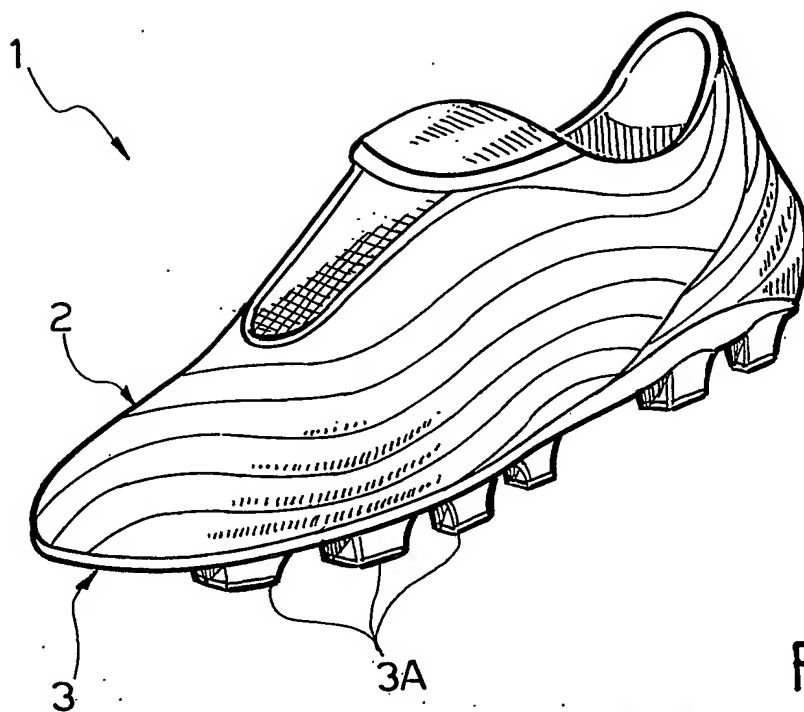


FIG. 2

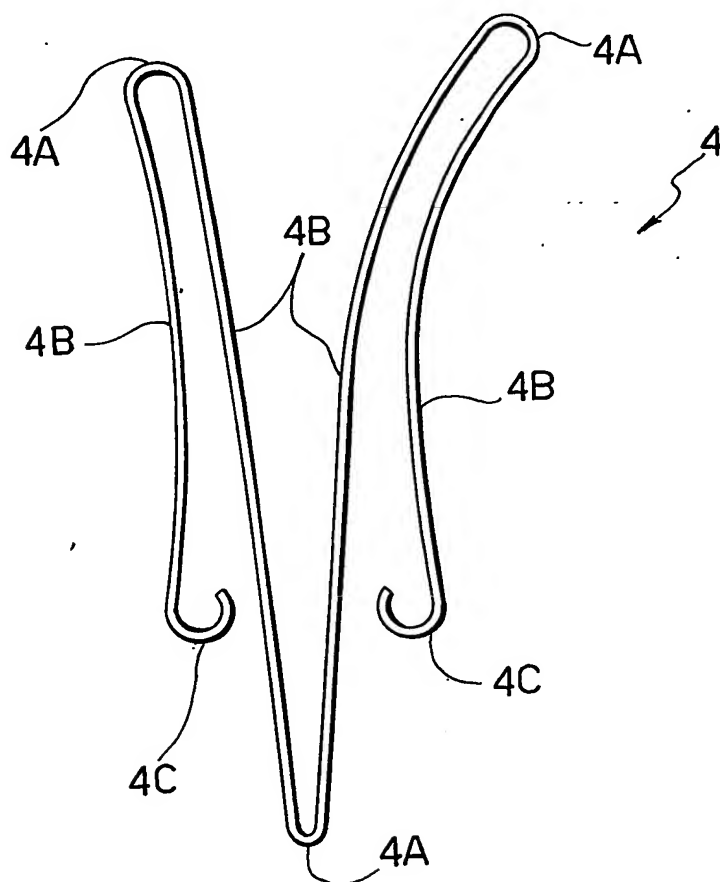




FIG. 3

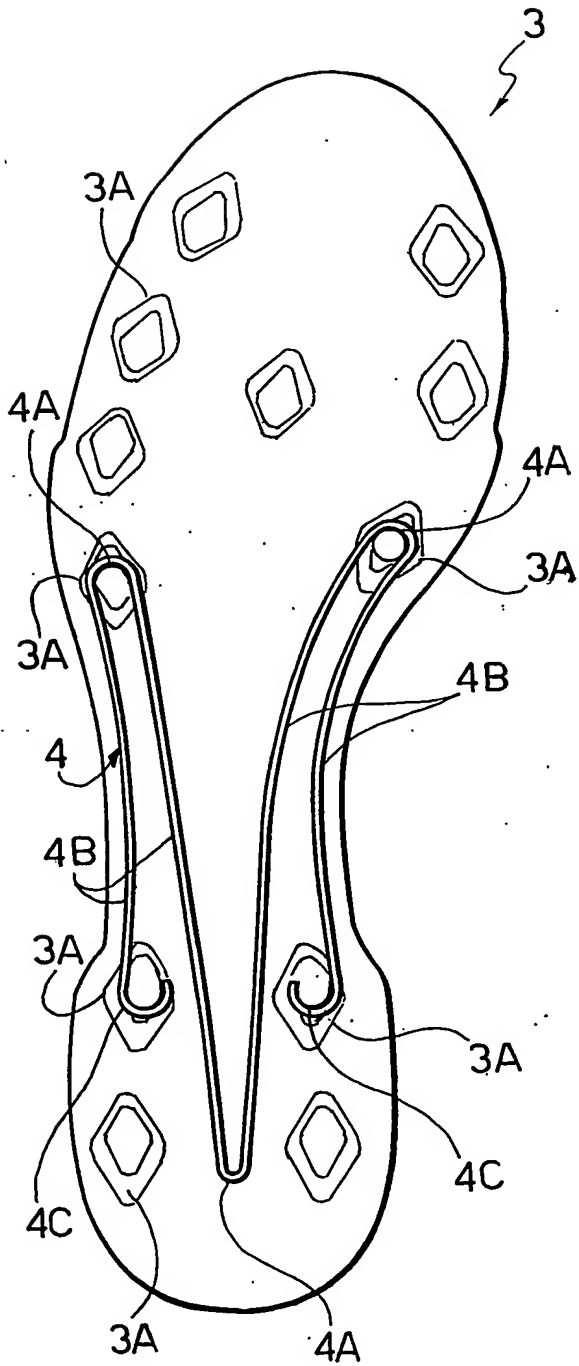


FIG. 4

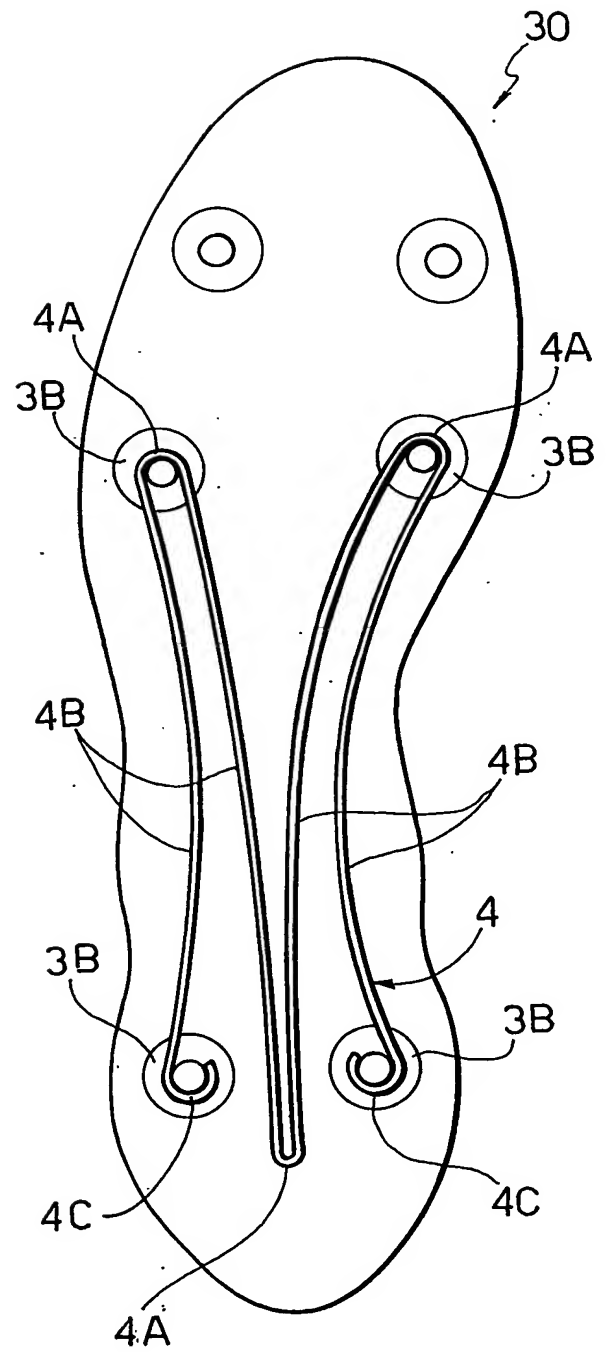


FIG. 6

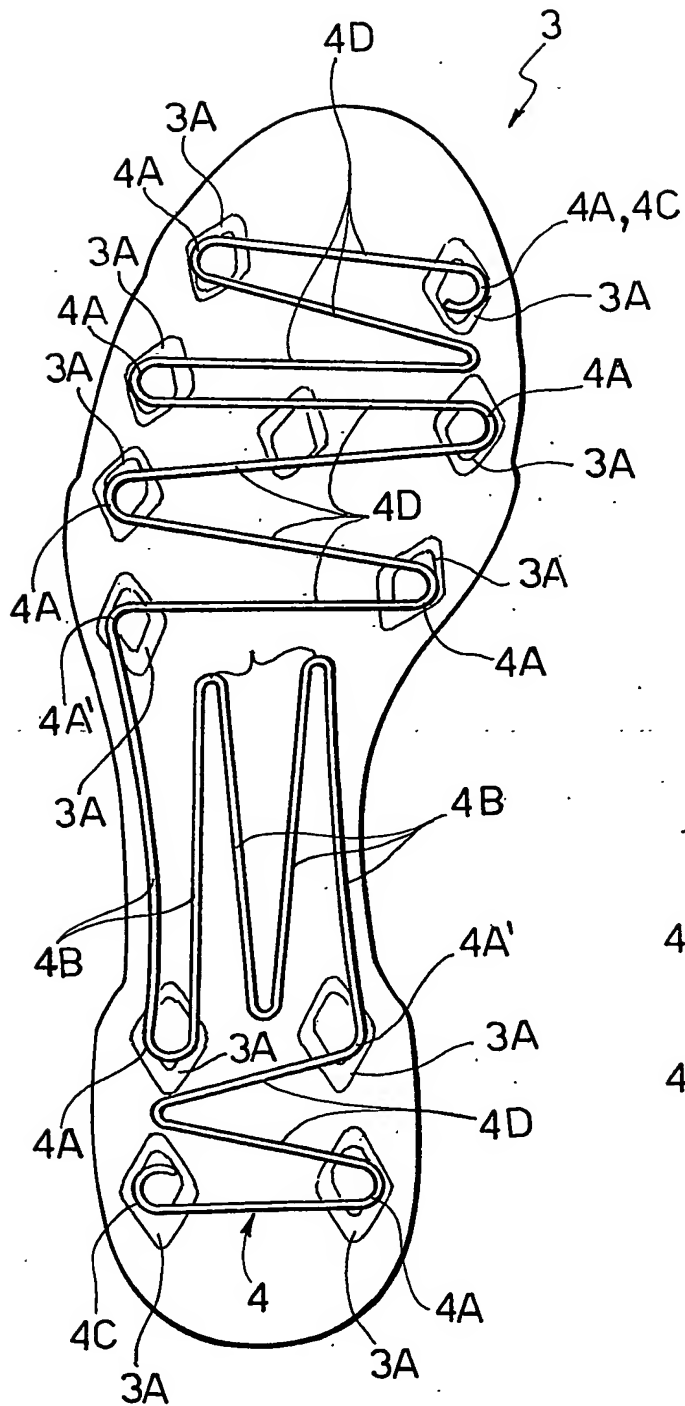


FIG. 5

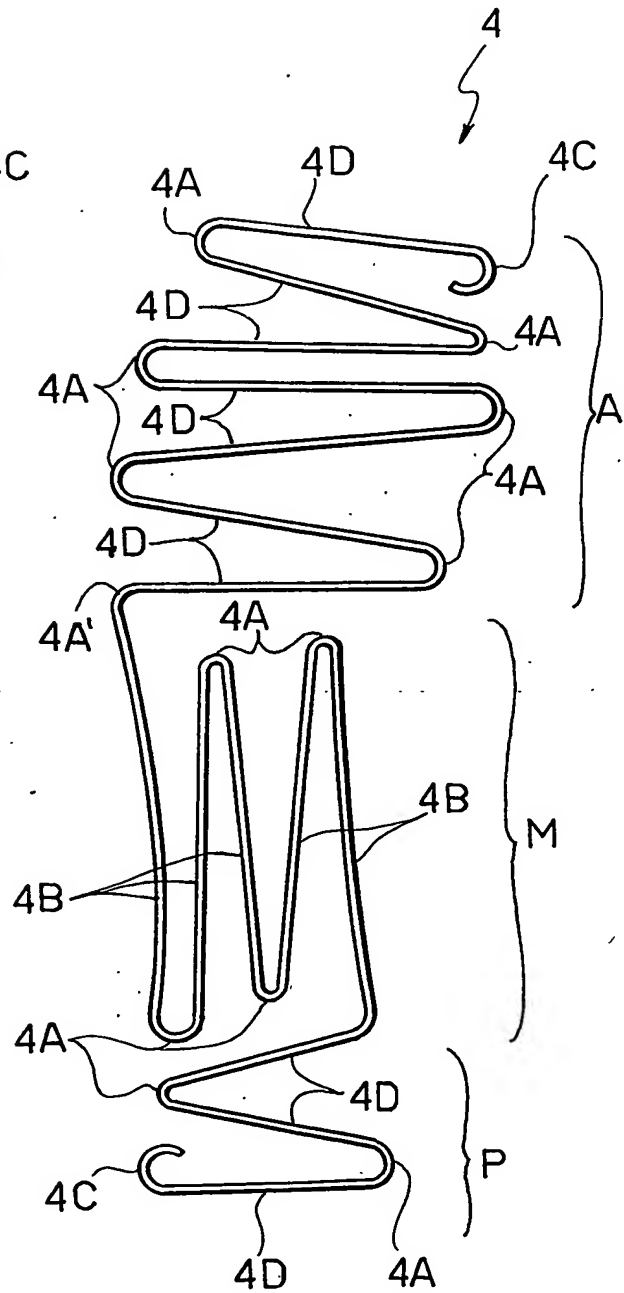


FIG. 8

FIG. 7

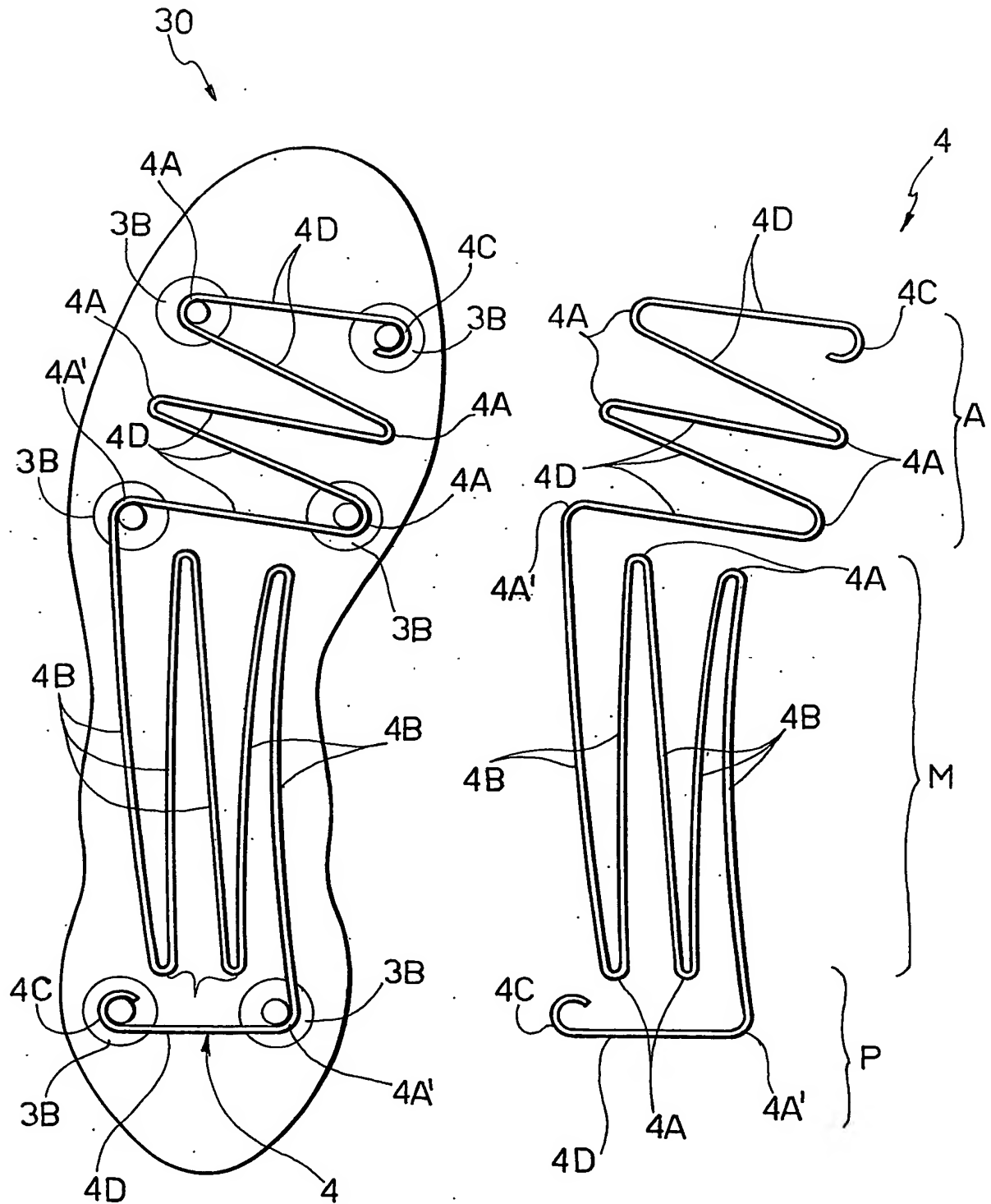


FIG. 10

FIG. 9

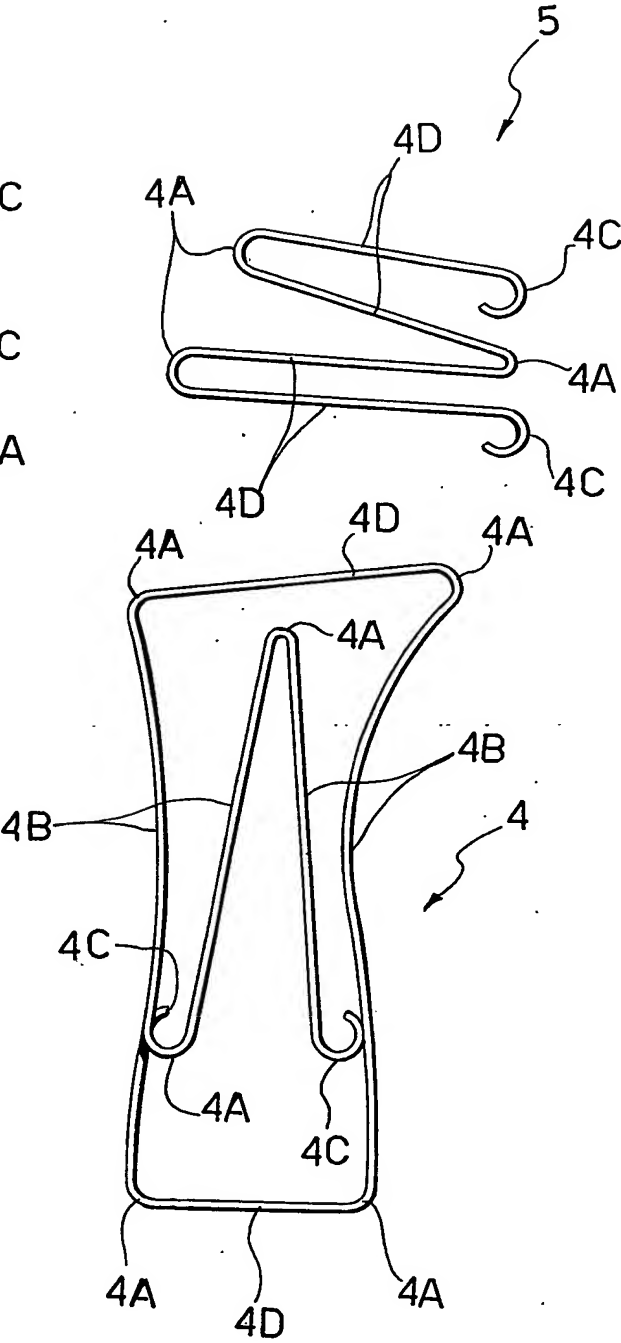
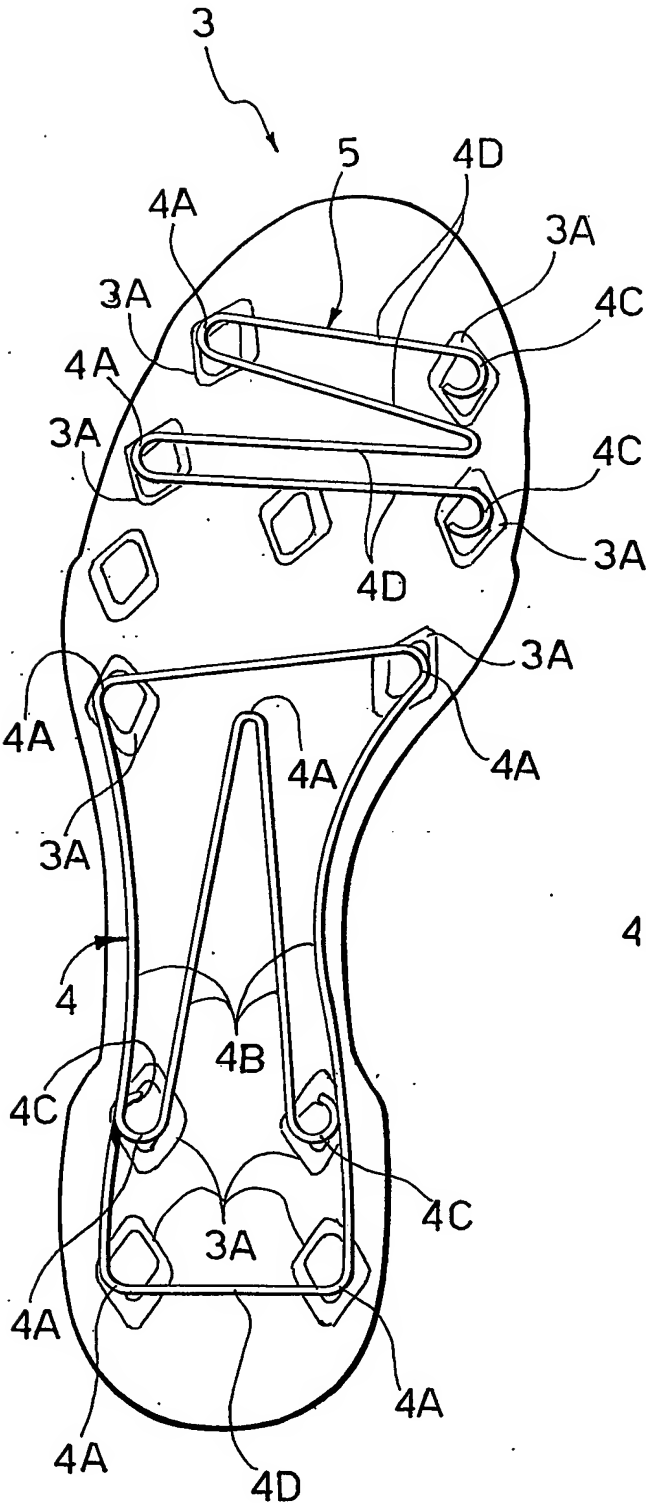
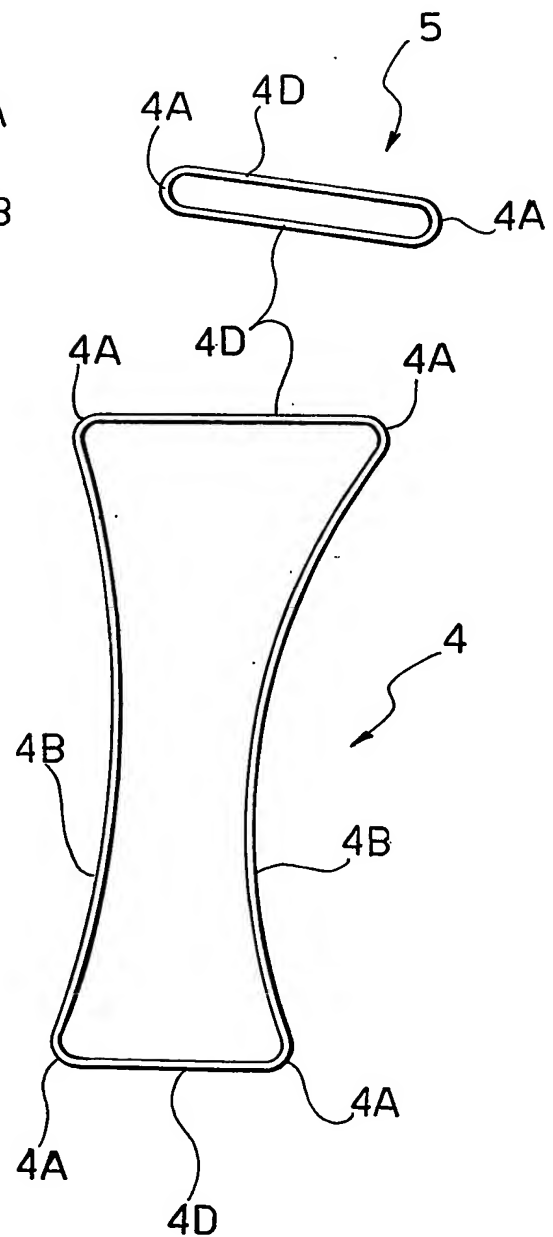
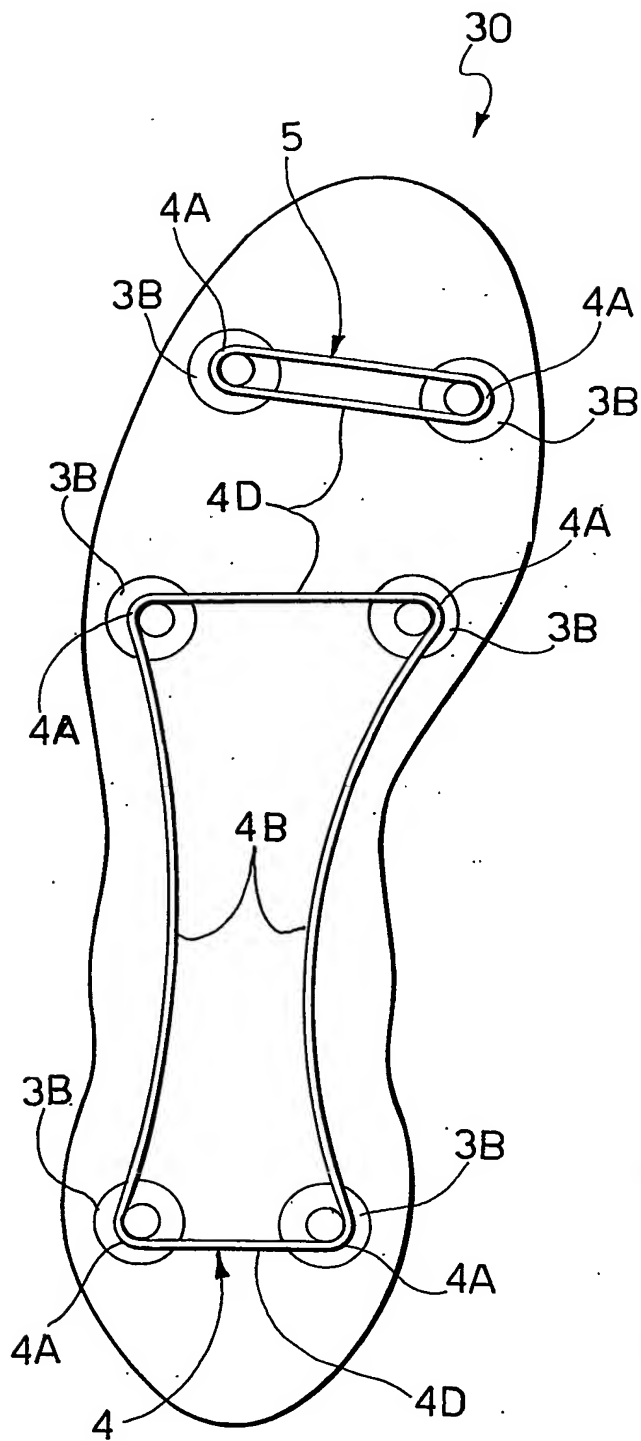


FIG 12

FIG 11



## INTERNATIONAL SEARCH REPORT

International Application No.

PCT/IB/05548

A. CLASSIFICATION OF SUBJECT MATTER  
 IPC 7 A43B13/12 A43B5/02

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 A43B A43C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 2 113 971 A (CROOK AND SONS LIMITED BENJAMI) 17 August 1983 (1983-08-17) the whole document	1, 13
A	DE 295 503 C (EDUARD POHLMLEY) 4 December 1916 (1916-12-04) the whole document	1, 13
A	US 5 452 526 A (COLLINS DAVID R) 26 September 1995 (1995-09-26) the whole document	1, 13

☐ Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

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Date of the actual completion of the international search

15 April 2003

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Name and mailing address of the ISA

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## INTERNATIONAL SEARCH REPORT

Information on patent family members

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